

1 1. A molecular complex which comprises:
2 a template having a plurality of ionic functional groups; and
3 a conducting polymer selected from the group consisting of polypyrrole,
4 polythiophene or poly(phenylene sulfide) and substituted versions thereof having
5 charges thereon which bind to the organic functional group, the complex having a
6 polypyrrole ratio of between about 0.5 to 4.5.

1 2. The complex of claim 1 wherein the template is selected from the group
2 consisting essentially of chiral polymers and polyelectrolytes.

1 3. The complex of claim 2 wherein the polyelectrolytes are selected from the
2 group consisting essentially of poly(styrene sulfonic acid), poly(acrylic acid), poly(vinyl
3 methyl ether-co-maleic acid), poly(methacrylate acid), poly(2-acryamido-2-methyl-1-
4 propene sulfonic) acid, poly(butadiene-maleic acid), poly(phenylene vinylene) and salts
5 and co-polymers thereof.

1 4. The molecular complex of claim 1 wherein the conducting polymer is
2 selected from the group consisting essentially of poly(acrylic acid) or poly(vinyl methyl
3 ether-co-maleic acid, and the conducting polymer is polypyrrole.

1 5. A method for the formation of a molecular complex comprising a template
2 having a plurality of ionic functional groups and a conducting polymer having charges
3 thereon which comprises:
4 forming a monomer template adduct in a pH range of between about 2 to 7; and

5 polymerizing the monomer to form the conducting polymer, the conducting
6 polymer ratio being between about 0.5 to 4.5.

7 6. The complex of claim 5 wherein the template is selected from the group
8 consisting essentially of chiral polymers and polyelectrolytes.

1 7. The complex of claim 6 wherein the polyelectrolytes are selected from the
2 group consisting essentially of poly(styrene sulfonic acid), poly(acrylic acid), poly(vinyl
3 methyl ether-co-maleic acid), poly(methacrylate acid), poly(2-acryamido-2-methyl-1-
4 propene sulfonic) acid, poly(butadiene-maleic acid), poly(phenylene vinylene) and salts
5 and co-polymers thereof.

1 8. The molecular complex of claim 5 wherein the conducting polymer is
2 selected from the group consisting essentially of poly(acrylic acid) or poly(vinyl methyl
3 ether-co-maleic acid, and the conducting polymer is polypyrrole.